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connect the sound with it. That none of the people who were nearest to the location of the fall saw anything descend after the light disappeared may be explained by the fact that everything was inky dark following the intense light. And all report that having had no previous experience with such phenomena it never occurred to them to look for anything of the kind.

According to the angles at which the body was seen from Newton and Eldorado, points about equi-distant on either side of where it disappeared, the altitude must have been about six or seven miles at the time of the explosion. According to observers in McPherson and Newton the meteorite traveled at an angle of approximately  $30^\circ$  with the horizontal. If this course were kept up until it struck the earth it should have traveled from ten to eleven miles farther south. But from the testimony of Mr. Stuart of Newton and of Mr. Peffley of El Dorado, the only persons who reported seeing a body fall after the light had disappeared, it should have come to earth from four to five miles south of the point at which the explosion occurred. This would place its location in the central part of Milton Township, just northwest of Brainard.

That the course of the meteorite was approximately due south is shown by the fact that it was seen to fall straight downward directly north of Ponca City, by two men of that city, and from the observations in Hillsboro and Marion, which indicate that it passed about midway between those two cities.

My conclusions are that on the night of December 17, at about 9:00 p. m., a meteorite of considerable size fell in Milton Township of Butler County, Kansas. It traveled directly south and descended at an angle of  $30^\circ$  with the horizontal, and exploded when about six or seven miles above the earth, flying into several pieces, one of which was of sufficient size to be plainly seen from a distance of 17 miles when giving off only a glowing red light, and of sufficient density to descend at a rapid rate of speed, and was finally lost sight of in the darkness at an altitude of something like two or three miles. Other pieces may have been equally large or larger, but if so they did not glow so as to render them visible at this distance. Since the body exploded at a comparatively low altitude the fragments are probably not deeply buried and may come to light in the process of tilling the land, most of which in this locality is in a state of cultivation.

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### Another Kansas Meteorite

Paper 28 of the 1925 Meeting at Manhattan

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On November 9, 1923, at 8:57 p. m., while standing with Professor E. L. Craik on East Euclid Street in McPherson, Kansas, the writer was privileged to witness the descension of a meteor which in bright-

ness surpassed any that I had seen before, with the probable exception of one which occurred some twenty years ago. It seemed from my position to be coming almost straight down on a line about thirty degrees south of west. The fact that it was descending in such a plane led me to think that it was worth while to try to locate the place of landing. Accordingly, I immediately marked the spot in which I stood and noted carefully the point at which the object disappeared behind a pine tree some nine rods away. A notice was sent to the press for others who saw the meteor to report as to the direction of its disappearance, its apparent course, its altitude, and the location of the observer. A few days later, assisted by Professor Chas. Morris, operating a transit, we were able to determine with a fair degree of accuracy the direction in which the meteor was seen to disappear; and a line drawn on the map in harmony with our findings passed through McPherson and Greensburg, Kansas. Later reports and calculations shifted this line so that it lay about ten miles farther south and parallel to the first location.

In a few days replies began coming in from those who saw the phenomenon establishing the fact that it was seen from points largely throughout the state of Kansas, parts of Oklahoma, and the northeast corner of New Mexico. It is probable that other would have reported from a greater distance had I used the sheets of wider circulation for my notice, instead of only Wichita papers.

Through the mail and through personal interviews reports were obtained from almost a hundred witnesses to this phenomenon, a few of which proved to be sufficiently definite to be of value in determining the location of the fall. By plotting on the map lines representing the more promising reports, a remarkable agreement was discovered in the fact that most of the lines intersected within a ten-mile circle adjoining Greensburg on the east. A few, however, from the western part of the state seemed out of harmony, and indicated points considerably farther west. This was disconcerting, since those agreeing on the Greensburg location were quite numerous, distributed widely on three sides of this point. However, those witnesses were in most cases 100 to 150 miles from the point of intersection and therefore the explanation might lie in the fact that Greensburg lay directly under the point at which a body traveling at the altitude of this meteorite would pass behind the horizon for observers at the distances named above. The variations in distance were not great with the exception of one, and this was from Herington, Kansas, which is almost exactly in the plane of descent of the body and would therefore not show any difference in the direction of the point at which the meteor disappeared. All of the other observers ranged in distance between 100 and 125 miles. One fact, however, stood in the way of drawing the conclusion that these many intersecting lines merely marked the point at which the meteor passed behind the horizon; and that was that several of those who saw it from this distance, and whose observations were among those which seemed to reflect

more than average intelligence, insisted that they saw the body burst into several pieces just before reaching the horizon.

The writer had been engaged to lecture before the Kiowa County Teachers Association on December 8 and determined to make further inquiry into the matter at this time. Accordingly, on December 7 an announcement was made before the Haviland High School, twelve miles north of Greensburg, and from several witnesses it was easily determined that the meteor had passed slightly south of that village and toward the southwest, where it disappeared before reaching the horizon. Other witnesses were found in Greensburg and in Belvedere and Protection to the south, to finally establish the fact that the light had disappeared at a point calculated to have been nearly five miles high, over the northeastern part of Clark County. This point is about twenty to twenty-five miles directly southwest of Greensburg. It was definitely established that its course was something like six or seven degrees from the horizontal. It was also ascertained that the body gave out loud detonations and that it shook buildings so that windows and doors rattled in the towns of Pratt, Haviland, Greensburg, and at other points along its course. No one who was in a position to see accurately could testify to any indication that there was an explosion or bursting of the body where the light disappeared in Clark County.

A visit to Clark County in December brought me into contact with local witnesses to the fall of this body, who were within a few miles of the point where it lost luminosity. It gave out terrible detonations and shone with startling brilliancy, but in the darkness no descending body was visible after the light disappeared. At the angle at which the body was traveling it would, if its course continued unchanged, have passed entirely across Clark County and into Meade County. Its line of travel projected would reach the earth in a distance of thirty-eight miles, but allowing for the downward bending of its course under the influence of gravity, it probably came to earth in the west-central part of Clark County. The fact that detonations described as "terrific", "mighty", "powerful", "awful", and the numerous testimonies that windows, doors, and dishes, were violently shaken in towns over which the body passed at an altitude of from ten to fifteen miles, seems to indicate that it is a mass of considerable proportions.

A visit to Clark County in December by three students and myself revealed the fact that its landing place is in one of the roughest areas in the state of Kansas. The abundance of black or reddish brown sandstone boulders renders the finding of the mass quite improbable. A search was, however, carried on during two days, at which time we were driven out by a blizzard.

If any of this meteorite is ever recovered, it seems more likely to be one of the fragments resulting from the explosion which seems to have occurred in the vicinity of Pratt, Kansas. Since this is a cultivated district a considerable sized piece would probably be found by the plow if not too deeply imbedded.

In the course of the investigation, several people testified to having "seen the meteor disappear at a point almost due south and a little east of Greensburg." These people were all located almost directly under the path of the main mass as determined by seemingly unquestionable evidence. A possible interpretation is that the explosion forty miles to the eastward resulted in two or more fragments, one of which was passed to the south of the main course and fell in the vicinity of Coldwater. If so, its velocity must have been such as to develop luminosity after the explosion. There is also evidence that a fragment flew off to the north of the main course and fell north of Greensburg, exploding again near the earth. The evidence of this, however, is less definite.

**A NEW KANSAS AEROLITE  
REFERABLE TO THE FALL OF NOVEMBER 9, 1923**

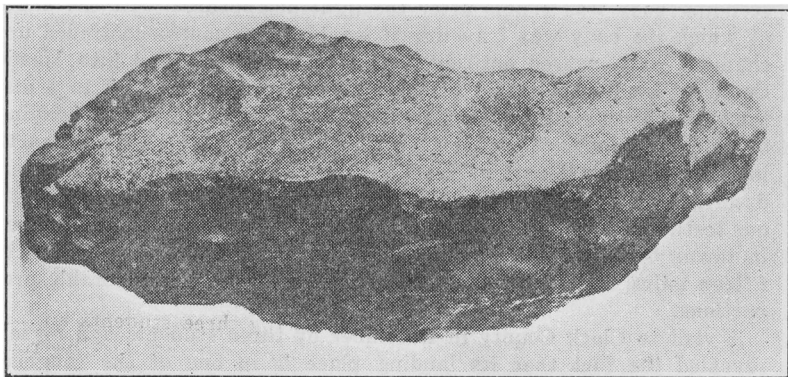
Paper 29 of the 1925 Meeting at Manhattan

(Written December 3, 1924)

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On October 31, 1924, while on my way to collect fossils in Clark County, in company with Mr. H. T. Martin of Kansas University, I was asked to examine a piece of what appeared to be meteoric stone in the office of the "Western Star" of that village. The stone proved to be a stony meteorite of eleven pounds weight. It had been plowed from a wheat field near by, a few weeks before.



The appearance of the stone led me to think that it was too old to be assigned to the fall of the previous November, being much fractured and of a distinctly reddish-brown color. I assumed that it had undergone a long period of oxidation, but two weeks later when I washed the specimen and examined it more carefully my conclusions were quite different. The original thin crust seemed to be almost completely intact, and shining points of metal projected visibly to the surface at several places on the stone. Microscopic sec-